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rather than the Hann, or driven, theory, best explains the facts discovered.

Anales de la Oficina Meteorologica Argentina, por su Director, Gualterio G. Davis. Tomo XII. *Climas de Asuncion del Paraguay y Rosario de Santa Fe. Segunda Parte: Discussion de las Observaciones hechas en Asuncion y Rosario.* 4to. Buenos Aires. 1898. Pp. 297. This is one of the valuable series of publications on the climate of the Argentine Republic which is being issued by Mr. Walter G. Davis, the Chief of the Argentine Meteorological Service.

R. DEC. WARD.

HARVARD UNIVERSITY.

CURRENT NOTES ON PHYSIOGRAPHY.

PHYSIOGRAPHY OF MARYLAND.

'A GENERAL Report on the Physiography of Maryland,' a dissertation by Cleveland Abbe, Jr., for the degree of doctor of philosophy at Johns Hopkins University (Maryland State Weather Service, i, 1899, 41-216), stands with the account of Missouri by Marbut, of New Jersey by Salisbury, and of New York by Tarr as one of the few thorough studies of State geography that have yet appeared in this country. Many items of interest might be abstracted from it. For example, those concerning the lower courses of the 'falls' or young cascading streams in the narrow gorges by which the Piedmont plateau is dissected for eight or ten miles inland from the fall-line, and the upper courses of the same streams which flow quietly through shallow open upland valleys where the effects of the elevation of the region are not yet felt. Again, those concerning the Hagerstown (Appalachian) valley, a well-finished and evenly uplifted peneplain, now rather sharply dissected by young streams in narrow meandering gorges, from which it is inferred that the streams meandered upon the valley floor before uplift of the region to its present altitude (500 feet in the neighborhood of the Potomac). A chapter on the development of the streams of the Piedmont plateau bears evidence of the greatest proportion of original study; it leads to the conclusion that the streams east of Parr's ridge (which represents a low swell surmounting the former lowland of the Schooley peneplain) have been superposed through a cover of coastal plain

strata that once extended further inland than now.

An introductory account of 'Physiographic Processes' contains a paragraph which may mislead by stating that the ridges of the Appalachian province have been 'formed by the folding and faulting of the paleozoic strata of that district.' A learner might thus be tempted to compare them with the young unsculptured mountain blocks of southern Oregon; yet, as indeed appears from other pages of the Report, the Appalachian ridges of to-day are as truly forms of circumdenudation as are the low hills of the coastal plain or the high hills of the Allegheny plateau.

THORODDSEN ON ICELAND.

THORODDSEN has prepared a most interesting summary of his eighteen years of exploration in Iceland (*Geogr. Journ.*, xiii, 1899, 251-274, 480-513). The island, 40,450 square miles in area, is the dissected remnant of a basaltic plateau, averaging 2000 feet in altitude, and for the most part barren and uninhabitable. Non-marine tertiary strata are intercalated within the basalt sheets, and a 'pelagonite breccia'** overlies them on a third of the surface. Deep valleys and fiords have been eroded in the margin of the plateau, where coast cliffs rise 2000 or 3000 feet; but in the interior the relief is less pronounced. Relatively modern lavas have been poured out abundantly on the plateau, building mountains, filling valleys, displacing rivers and altering the coast line. Of 107 volcanoes counted in a certain district, 8 were large lava and ash cones of the Vesuvian type, 16 were large flat domes of the Mauna Loa type, and the remainder were small ash cones arranged in chains along fissures. The summits of the domes, 2000 or 3000 feet in height over the plateau, are broken by large craters (calderas?) containing frozen lava lakes; many lava tunnels are found on the slopes of the domes, whose inclination is seldom more than 7° or 8°, and may be much less. The small ash cones may be as steep as 30° and occasionally 40° or even 50°: one chain contains

* This formation has lately been interpreted as of ancient glacial origin by H. Pjettersson. *Scot. Geogr. Mag.*, xvi, 1900, 265-293.

100 such cones along a 20 mile fissure. At some points, the lava has flowed quietly from fissures without forming cones or craters. Lava sheets and streams, sometimes scores of miles in length, are as barren as the domes of ice and snow. The more viscous flows have steep borders, so that they rise in ragged ridges, im-passable from being covered with loose clinkery fragments. The more fluid flows have formed smooth and nearly level fields, except that their surface is here and there disturbed by irregular subsidence, or broken by great cracks which turn back the traveler. Secondary craters are numerous on certain flows, sometimes to the number of hundreds crowded together, as if the flow had run over a marsh or lake. Parts of the plateau are covered with drifting sand, swept about in blinding storms. The whole island has been deeply covered by an ice sheet (except where an occasional volcanic cone rose as a 'nunatuk' or island), as is proved by abundant striations, morainic deposits and transported boulders, save over some 5000 square miles where the glaciated surface has been buried under the more recent lavas. Lakes of glacial origin are numerous. Sheets of ice and snow to-day cover about an eighth of the island area, mostly as mantles over the domes of the plateau from which a few glacial arms descend to lower levels.

The lowlands are of small extent. They consist of narrow coastal plains (strips of sea bottom revealed by recent elevation) or of fluviatile plains built forward by waste-laden glacial rivers. Two elevated shore lines on the inner margin of the coastal plains stand at heights of 250 and 125 feet, marked by cliffs, caves and beaches; the strata of these plains contain marine shells. The fluviatile plains or 'sandur' are chiefly developed on the southern coast, where the rainfall is two or three times heavier than in the north. Here one finds all the phenomena of aggrading braided rivers; a single glacial torrent may, on emerging from the highland, split into a hundred shifting channels, with islands of sand and clay occupying the meshes of the network. The rivers are exposed to 'ice-floods' when the glaciers of the highland domes are melted by volcanic heat; overwhelming turbid torrents then bear huge ice

fragments and abundant rock waste down to the sea. The southern coast has been rendered harborless by the growth of the 'sandur,' and the shore is frequently bordered by off-shore sand reefs, built by the heavy surf. Elsewhere the coast is extremely irregular, bold headlands projecting between long fiords, into which the streams from the uplands fall in high cascades. Rivers of clear 'mountain water' have not yet formed important delta plains; but where the rivers bring down 'glacial water,' the fiords are shoaled and extensive delta plains occupy their heads.

Settlements are limited to the lowlands, where the people pasture cattle and sheep on the plains, catch birds on the cliffs, and take fish from the sea. But besides suffering the disadvantages of an inclement climate, the lowlands are exposed to lava floods which bury the fields, to river floods which lay them waste, and to ash showers which poison the pastures, causing famine and death to beast and man. It is indeed curious that a people brave enough to discover distant Iceland in a stormy sea, hardy enough to inhabit it for a thousand years, and intelligent enough to develop a remarkable literature, should not have had enterprise enough to leave the island for a more favorable home. Evidently the world is not in the 'free market' that the older economists supposed.

W. M. DAVIS.

SCIENTIFIC NOTES AND NEWS.

ABERDEEN UNIVERSITY, at its graduation ceremony, conferred the degree of Doctor of Laws on Professor Josiah Royce, of Harvard, who had recently completed the second series of Gifford Lectures before the university.

PROFESSOR D. A. KENT, of the Iowa State Agricultural College has been appointed by the Sultan of Turkey, instructor of farming for the Turkish Empire.

PROFESSOR M. B. BRUMBAUGH, who holds the chair of pedagogy at the University of Pennsylvania, has been offered the office of Superintendent of Instruction at Porto Rico. It is understood that he will accept if he can secure a leave of absence of four years from the University.